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THE STUDY OF ASSOCIATION *TRAPETUM NATANTIS* IN THE MEADOWLANDS FROM THE MIDDLE AND INFERIOR BASIN OF CRIŞUL NEGRU RIVER

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Abstract

The meadowlands from the middle and inferior basin of Crisul Negru river form an area with rich flora and vegetation suitable for a complex fitocenological research and an ecologic and bio-economical study of the floor vegetation. This work represents a phytocoenologic, ecological, bioeconomic and ecoprotectiv study on the vegetation of the meadowlands from the middle and inferior basin of Crisul Negru river. Also, based on these area research results, after carrying out the floristic and fitocenological study of the meadowlands, the possibility to revaluate their productive potential will be established.

After conducting a 84 phytocenologic surveys on the meadowlands near Salonta locality, Olcea and Cefa villages there have been identified a number of twenty vegetal associations from which only one is examined in this work: Trapetum natantis Kárpáti 1963.

Key words: phytocoenoses, vegetal association, ecological factors, life forms, floristic elements.

INTRODUCTION

The middle and inferior basin of Crisul Negru river is located in NW Romania between 46°42' north latitude and between 21°16' east longitude, being enclosed between the basin of Crisul Repede river in the north and the basin of Crisul Alb river to the south.

The plain of Crişul Negru is situated in the hydrographic basin of Tisa, the plain being watered by Crişul Negru, which has a general course in the direction east-west, and by its confluents. Crişul Negru springs from the northern flank of Curcubăta peak, from the altitude of 1460 m, near the springs of Arieşul Mic. Regarding the hydrological data of the river Crişul Negru we have: the length of the river – 560 km; the medium flow – Zerind 31,40 m^3/s; the maximum registered flow – Zerind 648 m^3/s; minimum registered flow – Zerind 0,47 m^3/s.

The soils of the Crişul Negru Plain are characterized by diversity, their genesis being in close connection with the evolution of the Plain of Tisa. The region from the Plain of Crişul Negru is tessellated; the inter-region soils dominate (alluvial, swamp soil, gleic soil and pseudogley, salty soils).

On the Plain of Crişul Negru, the summers are hot and humid, and the winters are cold, sometimes accompanied with blizzards; in the winter, the periods of warming up are rare as the snow bed is thicker and more stable.

A part of the middle and inferior basin of the Crişul Negru River, being covered with primary herbaceous vegetation, has been broken up and used for agriculture. The meadows which hasn't been broken up, used by humans as pastures and meadows; as a result of canalizations and drainages these meadows suffered a saline progradation, and secondary halophile vegetation appeared, vegetation which is widely spread in this area.

MATERIAL AND METHODS

In cases of vegetation studies, observations and data gathered during field trips constitute the foundation of all future processing and interpretations, reason of which the methods of preparing and developing them must be complex, thorough, scientific and objective.

The methods of vegetation studying are those elaborated by J. Braun-Blanquet (1964), adapted to the particulars of the vegetation from the surveyed zone.

In what the execution of surveys and notations on the analyzed fitocenoses' structure is concerned, both quantitative and qualitative criteria were considered, according to authors Al. Borza and N. Boşcaiu (1965). The quantitative criteria were abundance and dominance according to the combined system of J. Braun-Blanquet, J. Pavillard (1928), supplemented by R. Tüxen (1955) and H. Ellenberg (1963).

After the field research the list of species is drawn up grouped by classes, order, families and ranges alphabetically, specifying the place and habitat where they vegetate, the locality and an ecological summary (bioforms, geo-elements, ecological clues and economic importance). The taxons identified in the field will be harvested and put away for conservation (herborized) and identified by specialty catalogues (acc. to the volumes "Flora României"/Romania's Flora 1952-1976 and "Flora ilustrată a României"/Romania's Illustrated Flora 2003 by V. Ciocârlan, etc.).

The synthetic table of association contains information on species from the floristic composition, the life forms, the floristic element, the ecological indices (moisture, temperature, chemical reaction of the soil), the serial number of surveys, altitude (m.s.m.), area (m²), the coverage of grass layer (%). The quantitative assessment of the participation of each species in the tables of associations was made with the index of abundance-dominance. At the end of tables the constance (K) phytocoenotic synthetic index was calculated and noted, whose classes ranging from I-V expresses

the degree of cenotic fidelity of each species to the phytocoenoses environment.

RESULT AND DISCUSSION

The phytocenosis of this association were identified in the barrage with permanent water retention (Buzaş), near Olcea village, Rădvani fishery, near Cefa village, and in the drainage, near Salonta locality, respectively.

The phytocenosis of association *Trapetum natantis* (Fig. 1) have a character clearly hydrophile, impressed by the dominant species, *Trapa natans* and by the large frequency of some hydrophilic species: *Potamogeton nodosus*, *Ceratophyllum demersum*, *Myriophyllum spicatum*, *Hydrocharis morsus-ranae*, etc.

Fig. 1 – Association *Trapetum natantis* Kárpáti 1963,
Rădvani fishery, Cefa village, Bihor county.

The association *Trapetum natantis* (Table 1) totals 10 species. The physiognomy of the association is impressed by *Trapa natans* with a coverage of 71,87% ADm and a maximum constancy.

Table 1

Trapetum natantis Kárpáti 1963

Bio.	E.f.	U	T	R	2n	No. Land Surveys	1	2	3	4	5	6	7	8	K	A	Dm
						Altitude (m.s.m.)	120	120	100	110	110	100	100	105			
						Area (m²)	40	20	5	6	25	4	20	16			
						The coverage of grass layer (%)	100	90	85	85	90	100	80	100			
Hh	Eua(M)	6	4	4	D-P	As. Trapa natans	5	4	4	4	4	5	4	5	V	71,87	
						Potamogetonetalia, Potamogetonetea											
Hh	Cp	6	3,5	4	P	Potamogeton nodosus						+	1	.	.	1	1	+	1	IV	2,62
Hh	Cosm	6	3	0	D	Ceratophyllum demersum	1	2	2	2	2	.	1	.	IV	10	
Hh	Cp	6	0	4,5	P	Myriophyllum spicatum	1	+	1	+	.	.	.	.	III	1,37	
Hh	Eua	6	3,5	3,5	P	Hydrocharis morsus-ranae	.	.	+	1	.	.	.	.	II	0,68	
Hh	Cosm	6	3,5	4	P	Potamogeton crispus	+	1	.	.	.	.	.	.	II	0,68	
						Lemnetea											
Hh	Eua	6	3	3	D	Salvinia natans	.	.	+	+	1	1	1	+	IV	2,06	
Hh	Cosm	6	0	0	P	Lemna minor	.	.	.	.	.	.	1	1	II	1,25	
						Phragmitetea											
Hh	Eua(M)	6	3	4	D	Sagittaria sagittifolia	.	.	.	.	+	+	+	+	III	0,25	
						Accompanying											
Hh	Eua(M)	6	3	0	D-P	Butomus umbellatus	.	.	+	.	.	.	.	.	I	0,06	

Place and date of surveys: 1, 2 – Barrage with permanent water retention (Buzaş), Olcea village, Bihor county, 28.06.2009; 3, 4, 5 – Rădvani fishery, Cefa village, Bihor county, 25.07.2010; 6, 7, 8 – Drainage, Salonta locality, Bihor county, 17.08.2010.

The analysis of the association on the aspect of the main ecological factors (Fig. 2) emphasize the dominant hydrophile character (100%, U_6 = 10 species). Depending to the temperature, the association has a micro-mezotherm character (70%, $T_{3-3,5}$ = 7 species), followed by thermic amphitolerant (20%, T_0 = 2 species), and depending on the chemical reaction of the soil, it manifests a slightly acid-neutrophile character (50%, $R_{4-4,5}$ = 5 species), followed by euriionic character (30%, R_0 = 3 species).

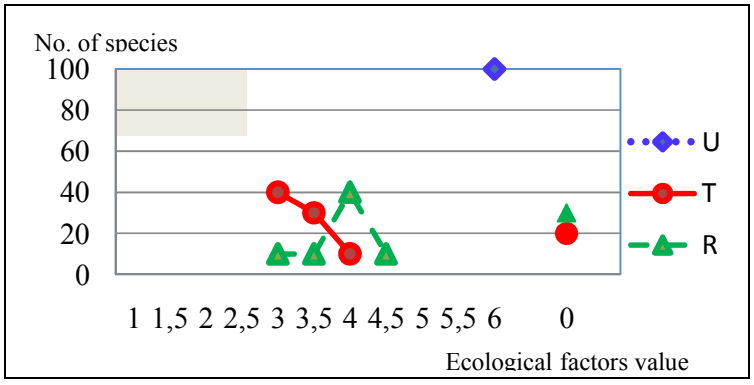

Fig. 2 – Diagram of ecological factors for the association
Trapetum natantis Kárpáti 1963, where:
U – humidity, T – temperature, R – the chemical reaction of the soil.

The life forms spectrum (Fig. 3) is dominated entirely by helohidatophytes (100%, Hh = 10 species).

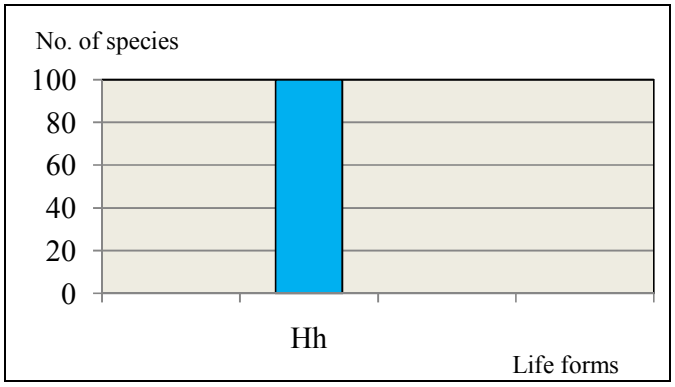

Fig. 3 – The life forms spectrum of association
Trapetum natantis Kárpáti 1963, where: Hh – Helohidatophytes.

From the point of view of the floristic elements (Fig. 4), most of them are euroasiatic species (50%, Eua = 5 species), followed by cosmopolite species (30%, Cosm = 3 species) and circumpolar species (20%, Cp = 2 specii).

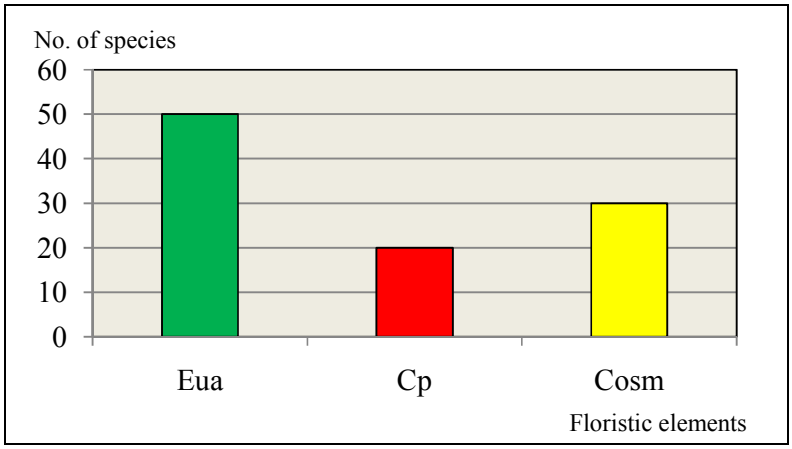

Fig. 4 – Spectrum of floristic elements of the association *Trapetum natantis* Kárpáti 1963, where: Eua - Eurasian; Cp - Circumpolar; Cosm – Cosmopolitan.

The diploid (30%, D = 3 species), the polyploid species (50%, P = 5 species) and the diplo-polyploid (20%, D-P = 2 species) partake in the karyotype spectrum (Fig. 5).

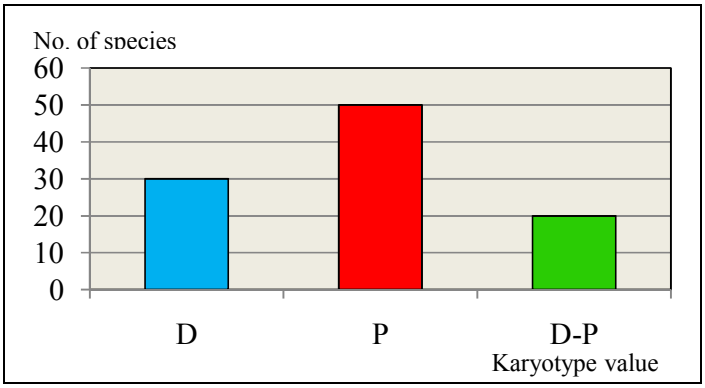

Fig. 5 – The karyotype spectrum of association *Trapetum natantis* Kárpáti 1963, where: D - diploidy; P – polyploidy; D-P – diplo-polyploidy.

CONCLUSIONS

After the fitocenological, ecological and bio-economical study of the floor vegetation from the searched area, a summary of the vegetal associations will be made specifying the characteristics of cenotaxons and the dynamics and succession of the vegetal formations from the meadowlands of the middle and inferior basin of Crisul Negru river.

After completion of floristic and fitocenological study of the lawns, their productive potential development possibilities will be established, together with the specification of the species, fitocenoses and rare ecosystems protection measures.

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